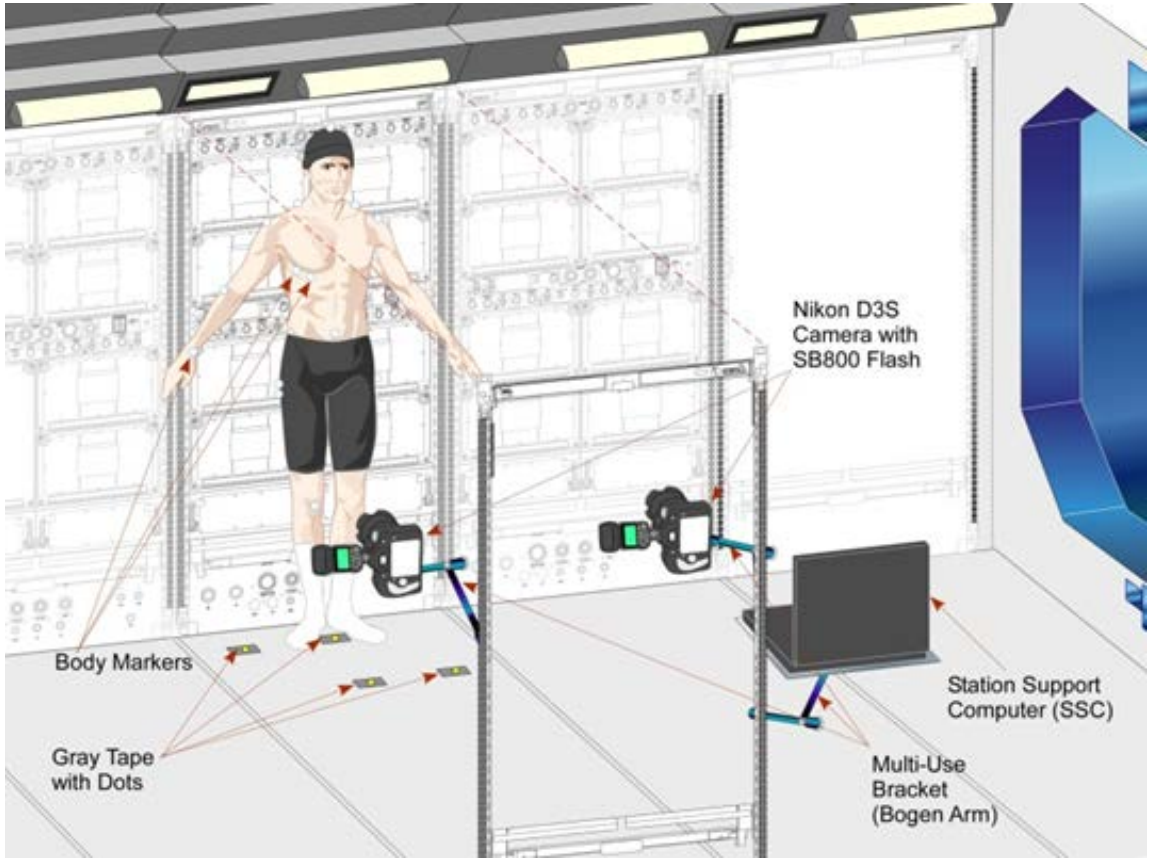
NASA Anthropometry and Biomechanics Facility

Human Modeling

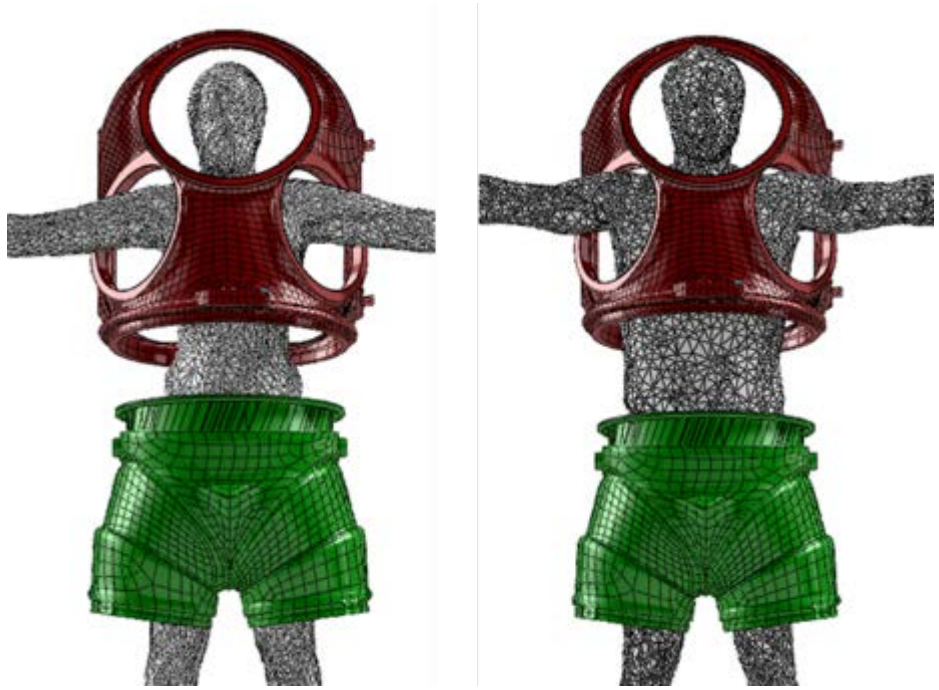
3/22/17

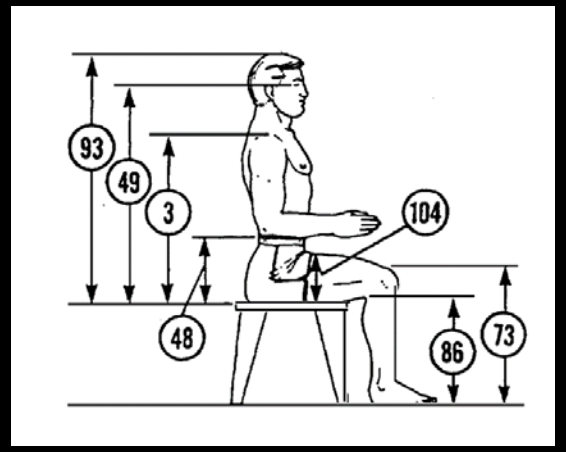
Population Size Variation

In-flight Anthropometry and Posture Changes



Accommodation Challenges





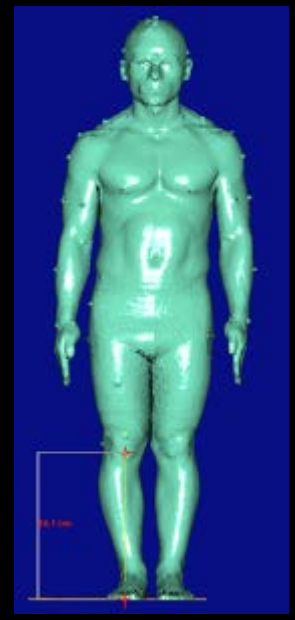
Linear Anthro

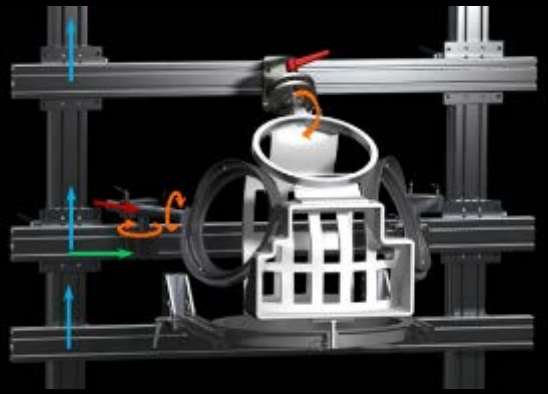
3D Laser Scans

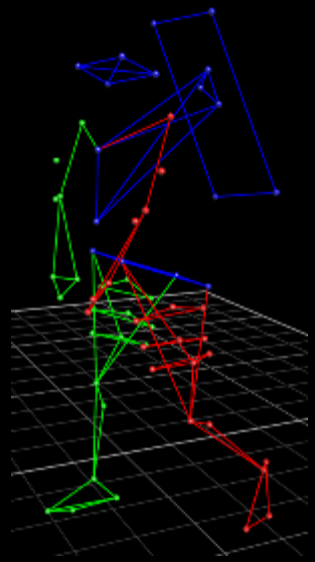
Data Collection for Model Input + Validation

RHUT

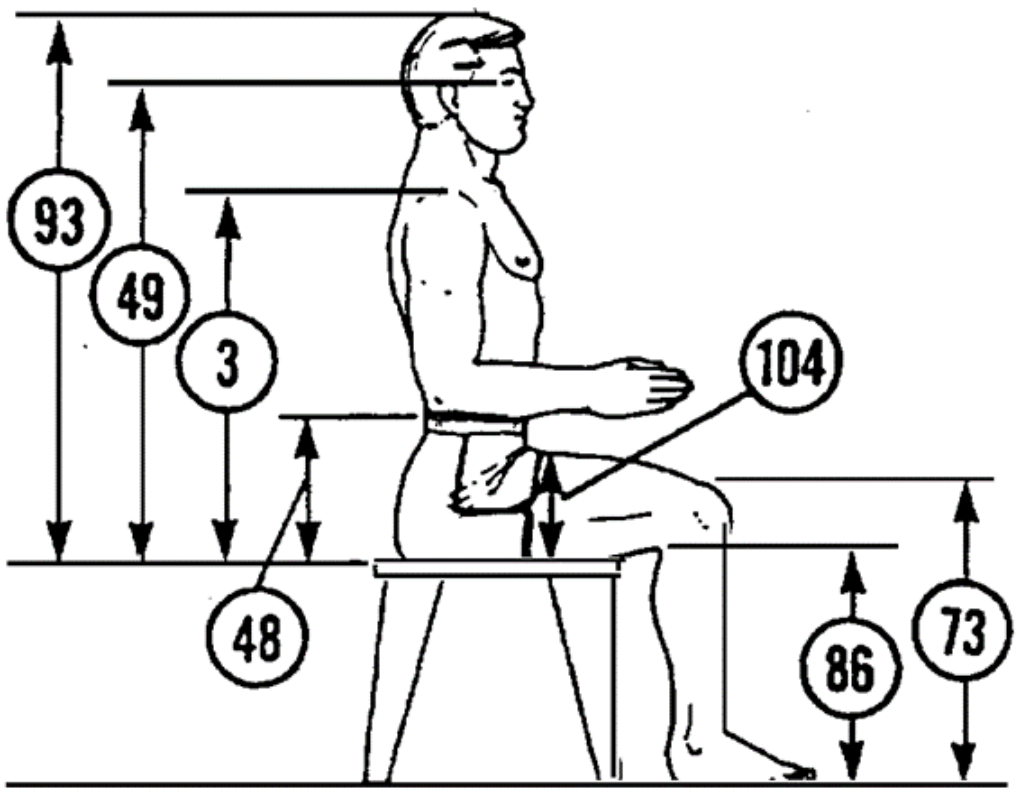
Motion Capture



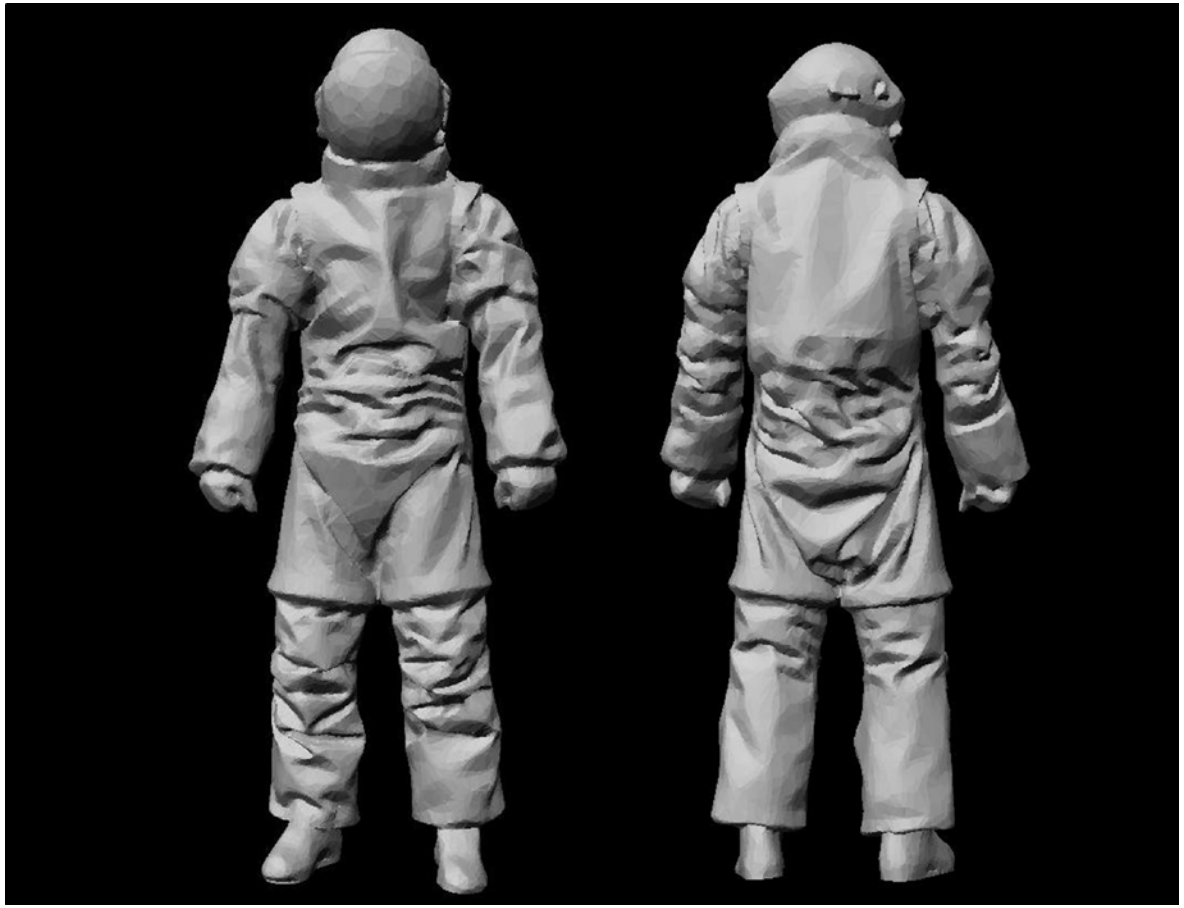




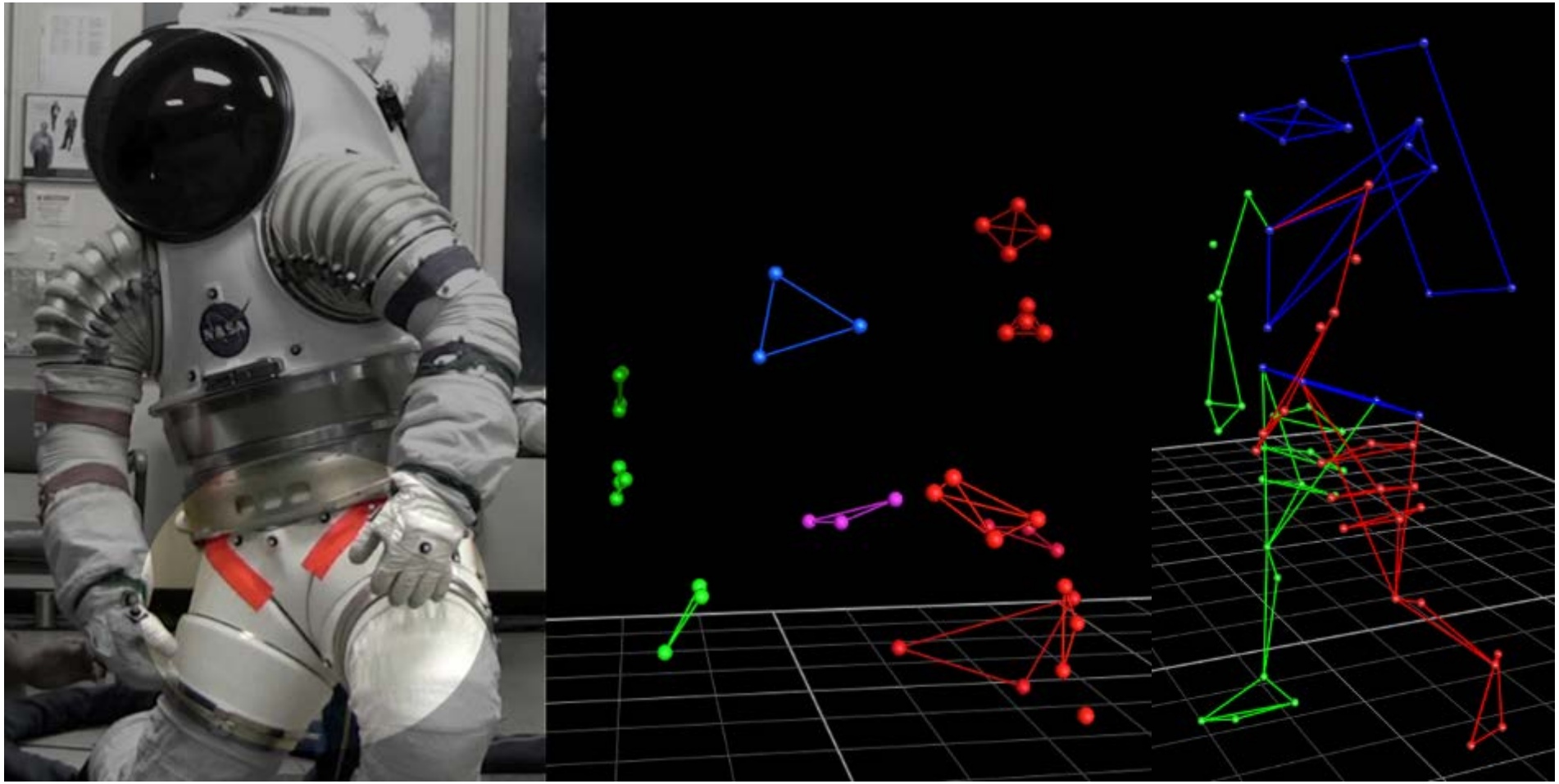
Linear Anthropometric Measurements



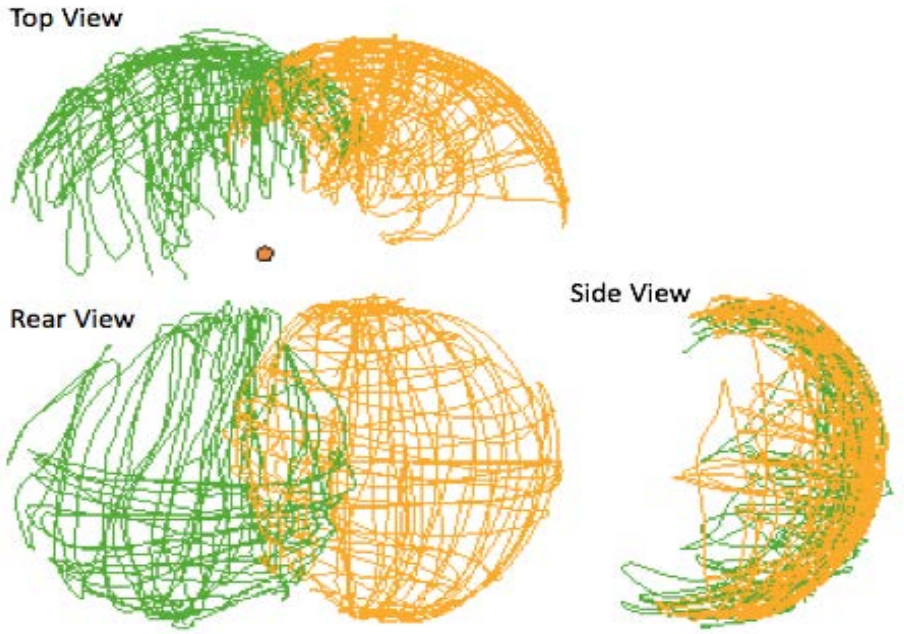
Full Body Laser Scans



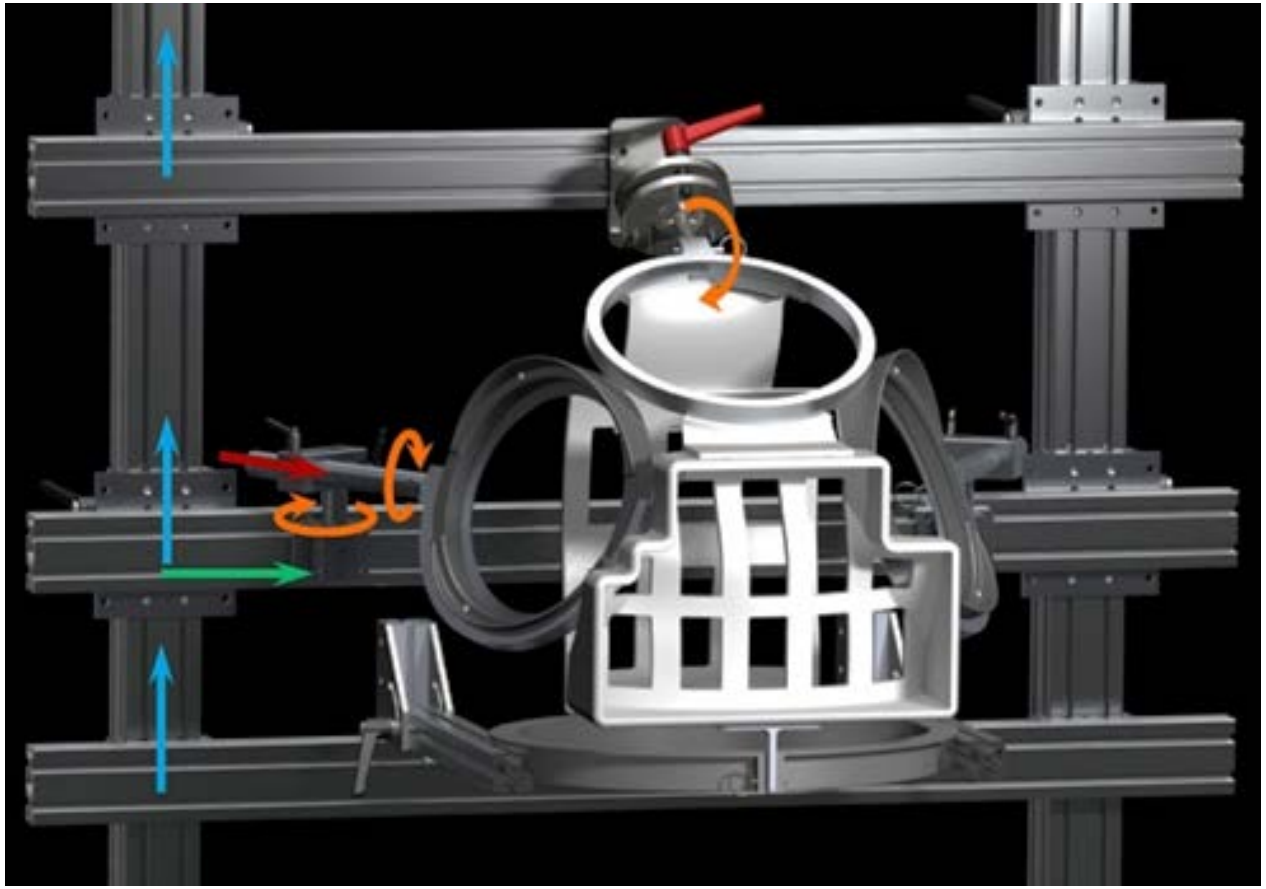
Motion Capture

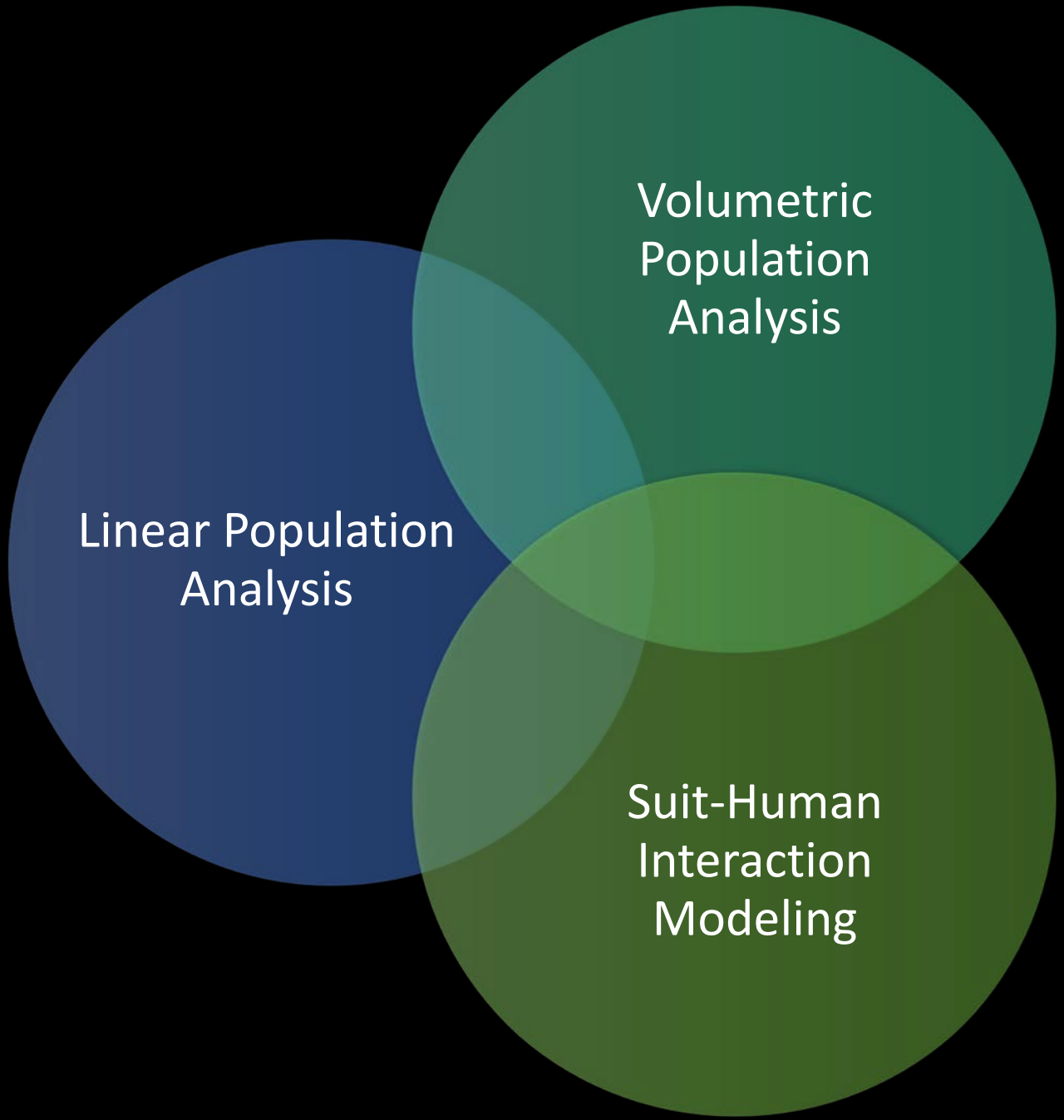


Underwater Motion Capture

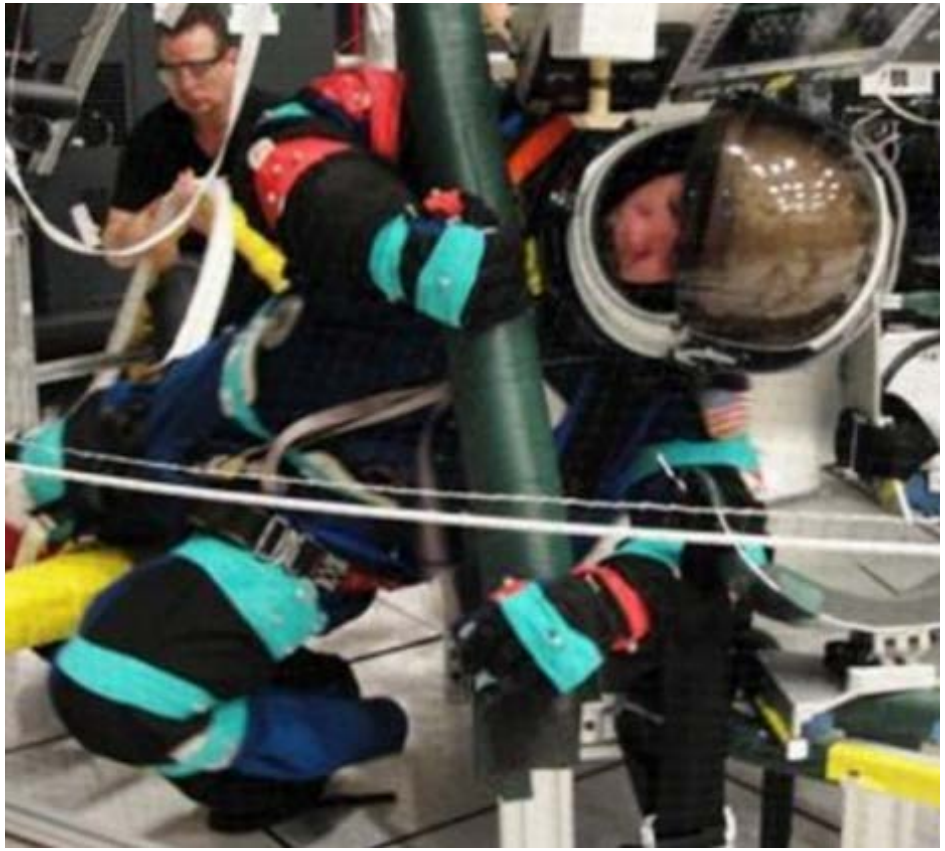


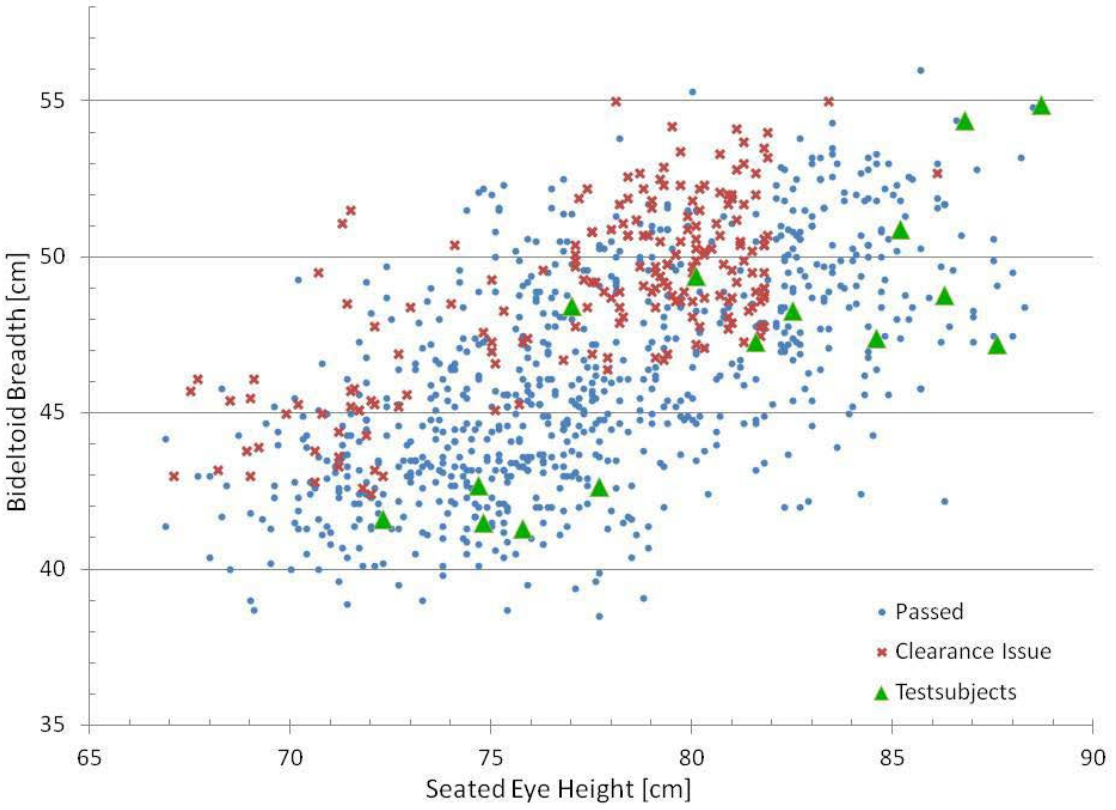
Reconfigurable Hard Upper Torso



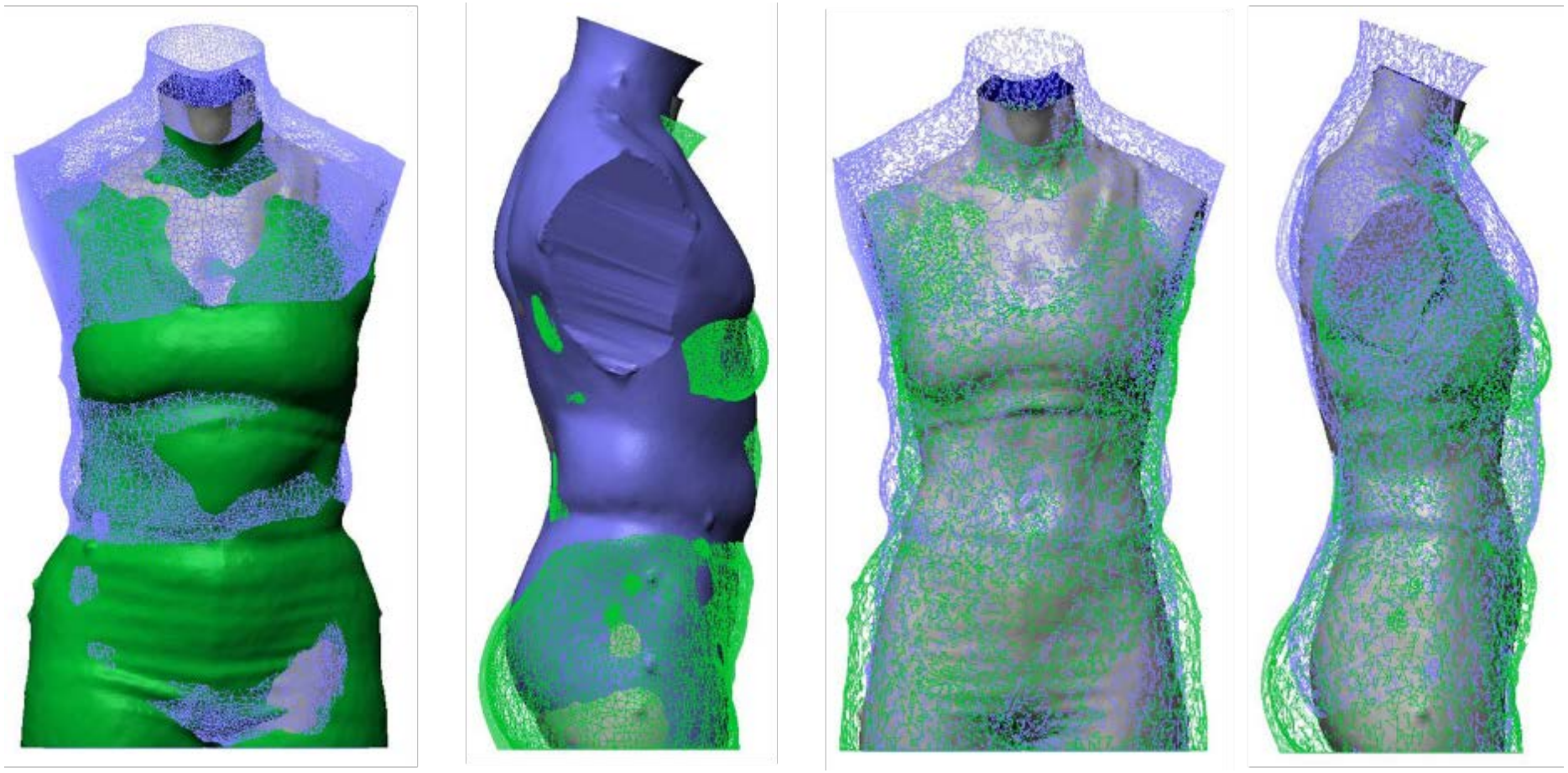

Volumetric Population Analysis
Linear Population Analysis
Suit-Human Interaction Modeling

Population Analysis – Linear Anthropometry

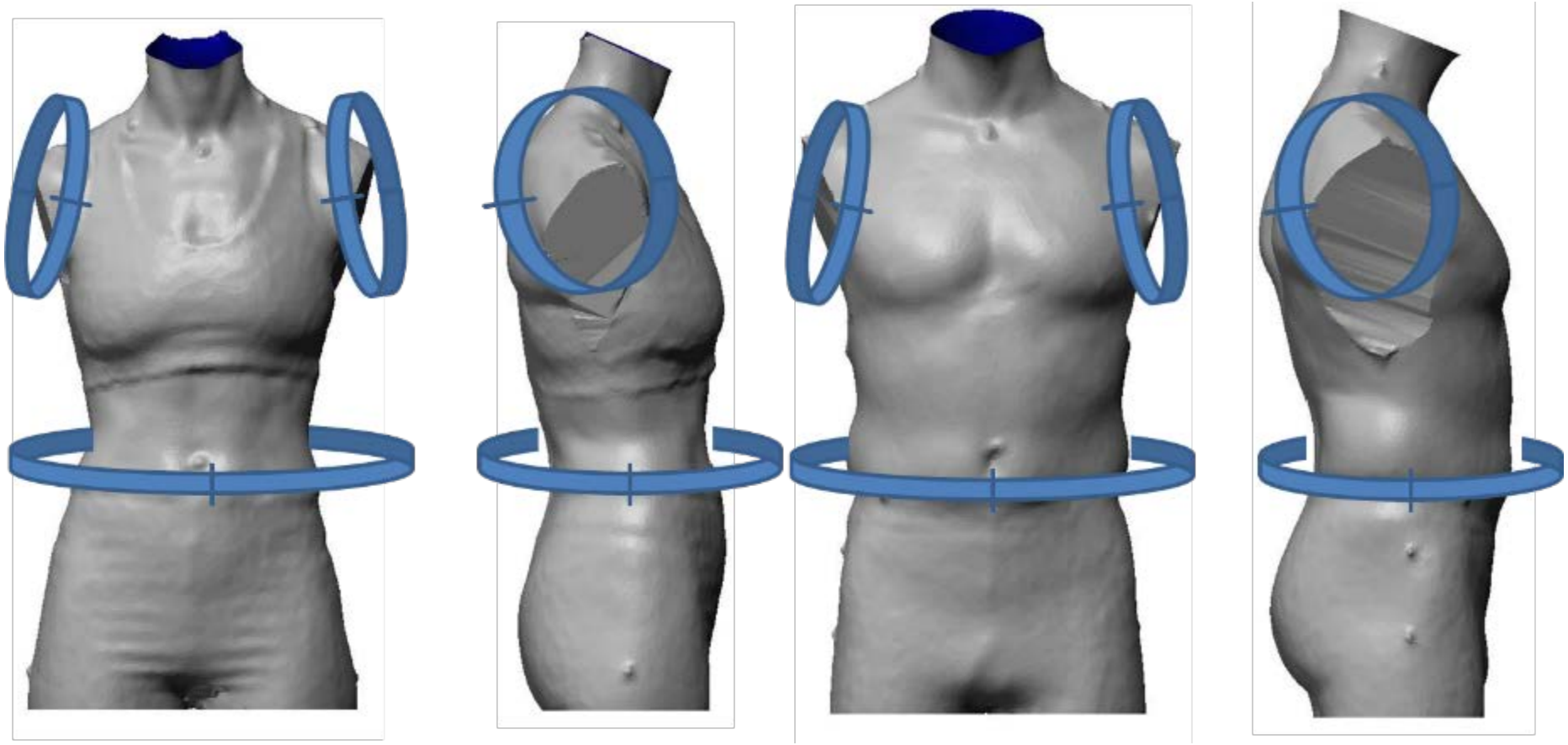


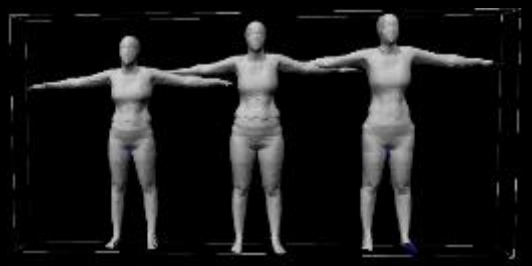


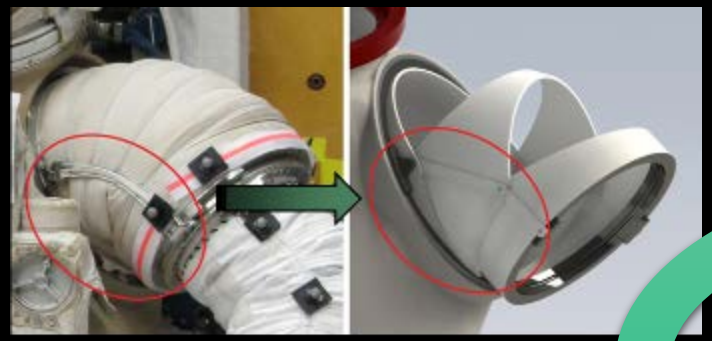
Population Analysis - Volumetric



EMU Scye Bearings Overlay

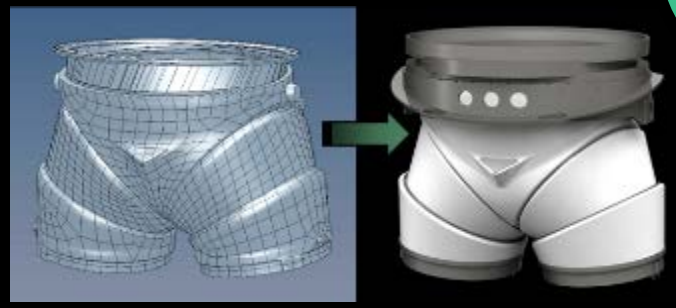






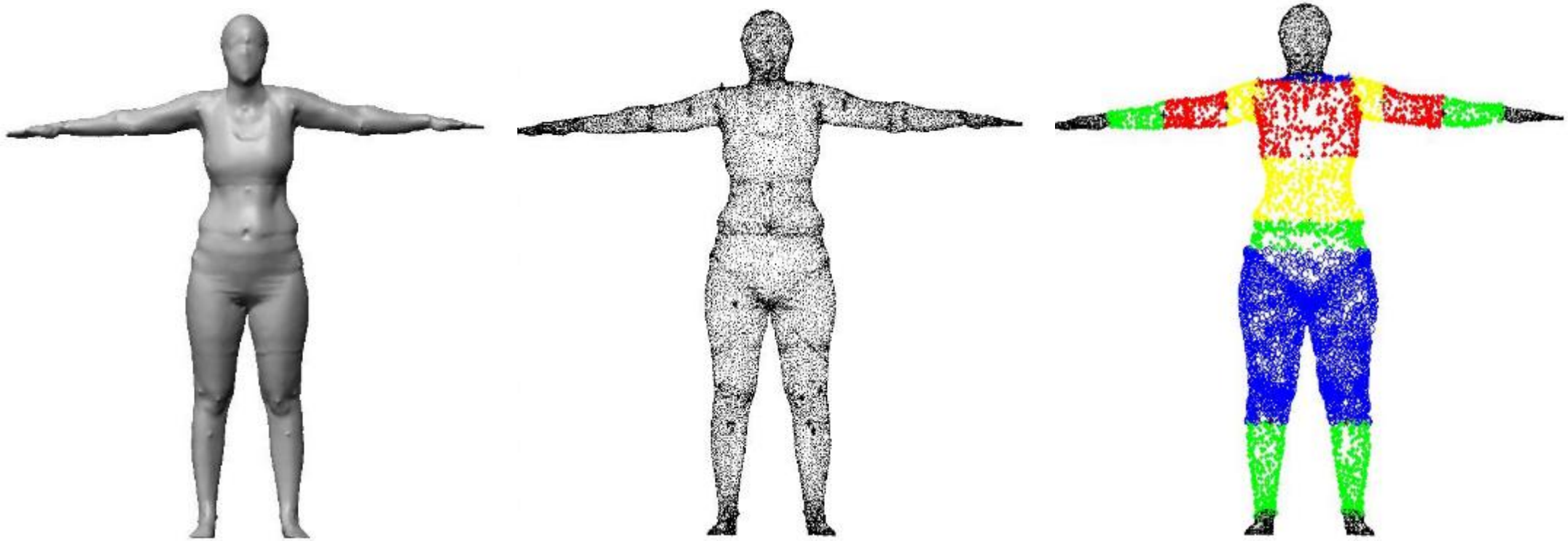
Parametric Human Body Models

Suit CAD Models

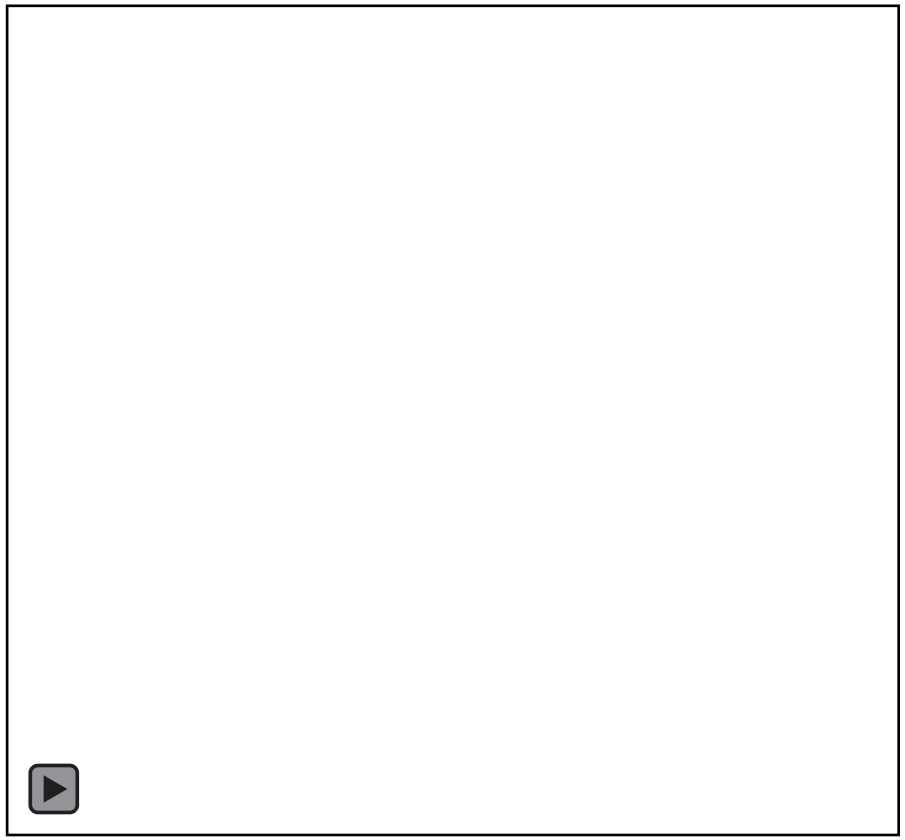


Integrated Suit-Human Models

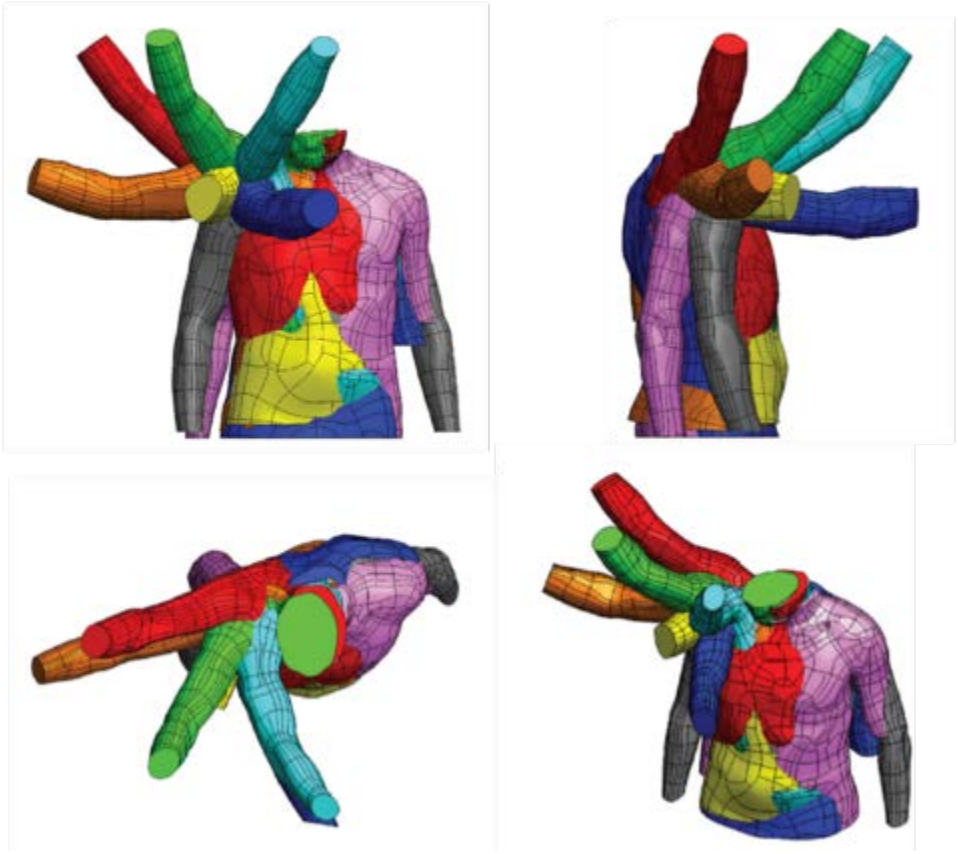
Boundary Manikins



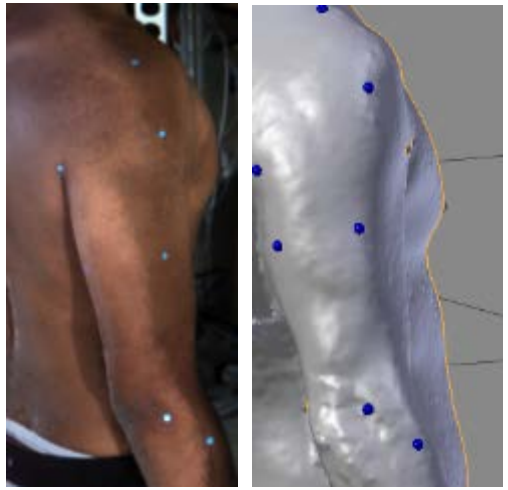
ABF Body Shape Model Toolkit

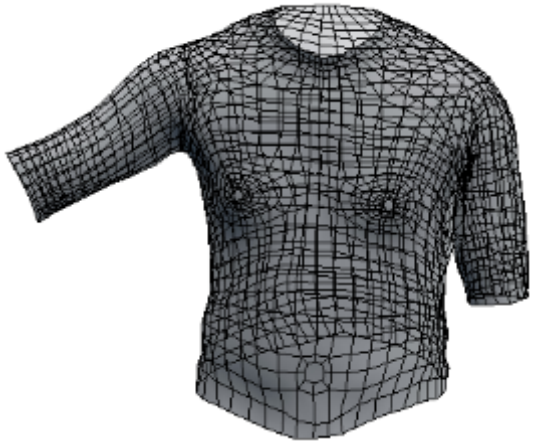


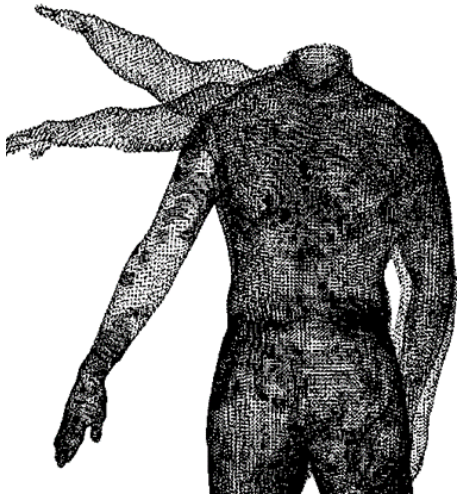
Static Shoulder Deformation Model

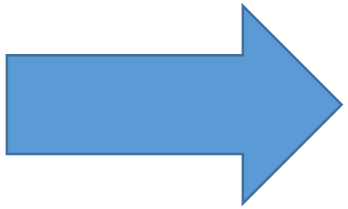


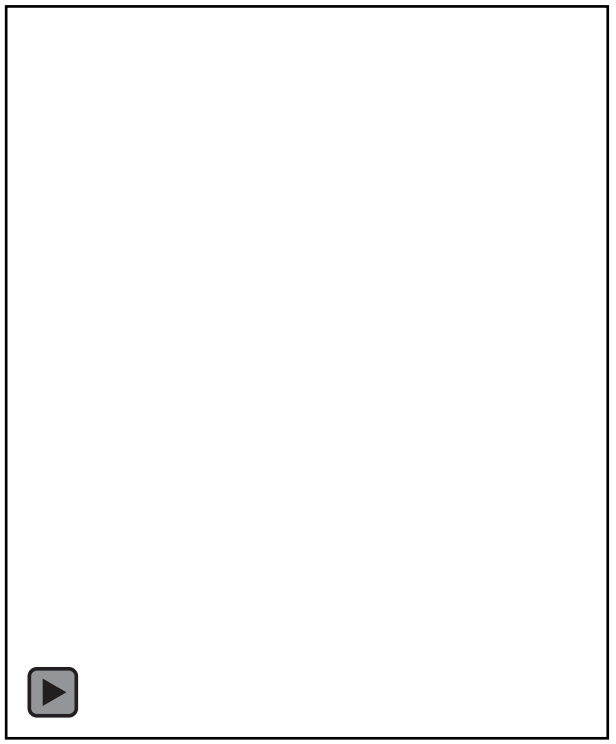
Parametric Shoulder Articulation Model



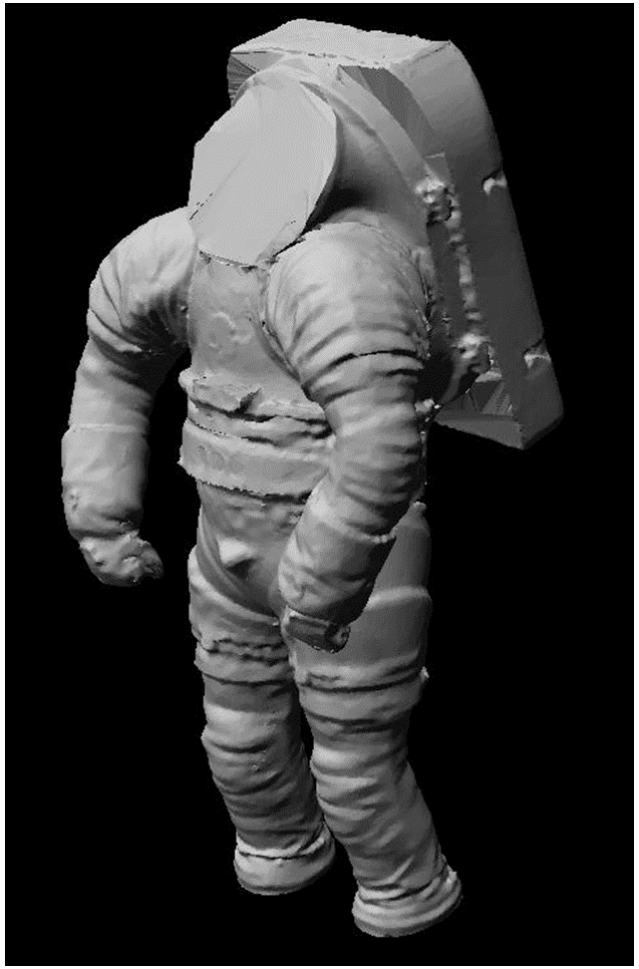


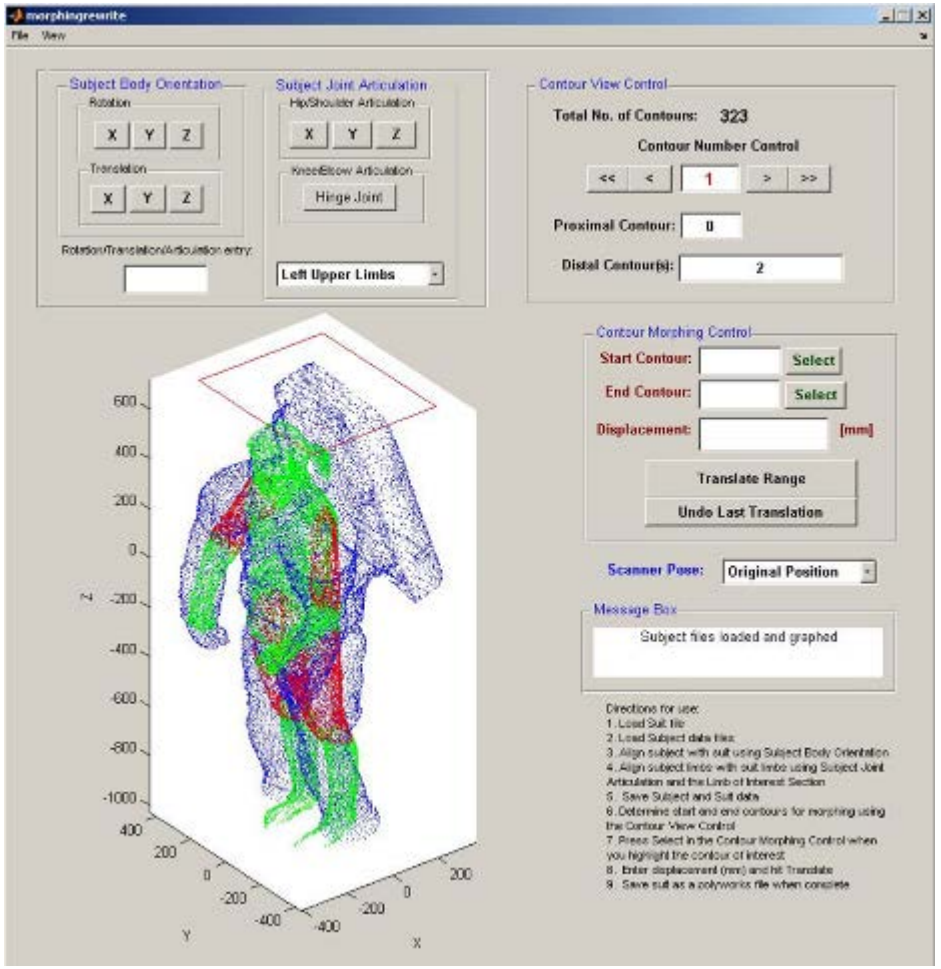




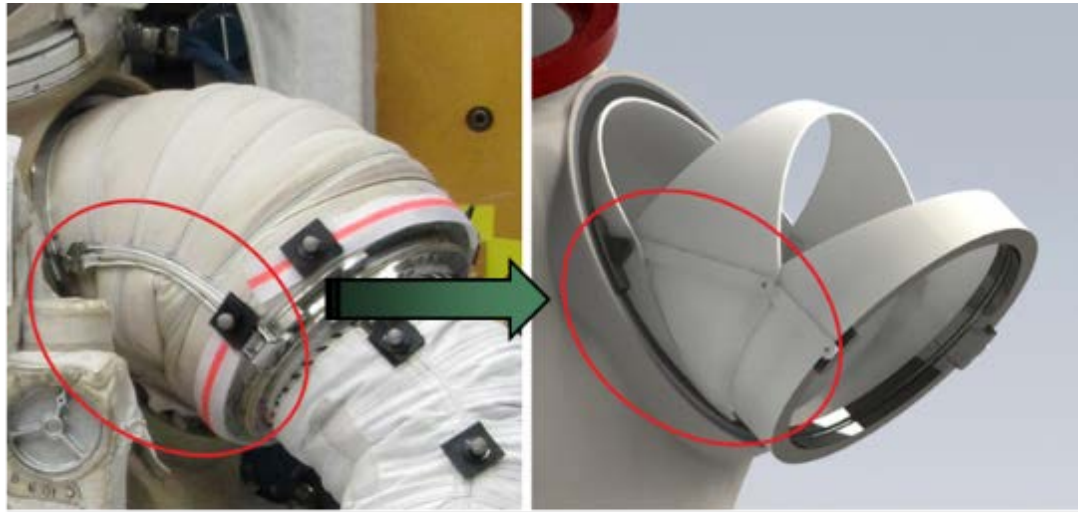


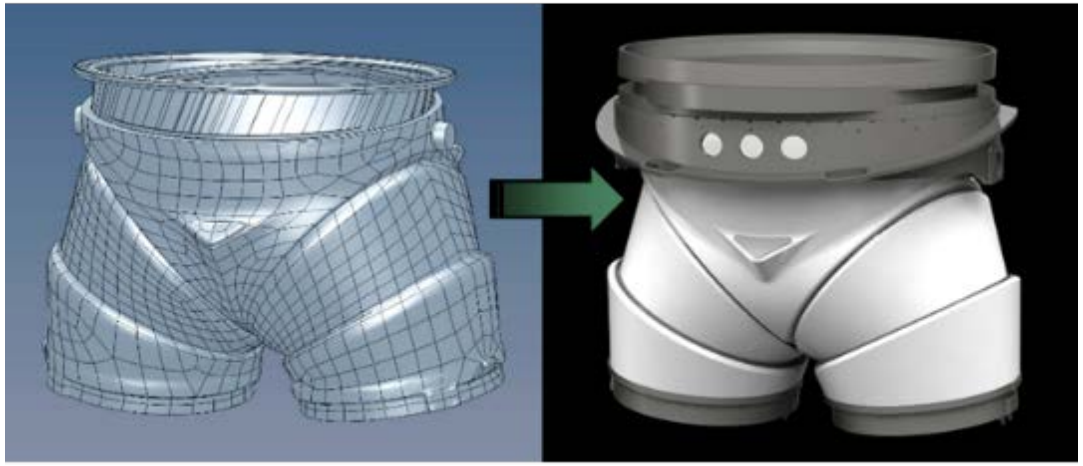
Morphing MK III and Subject Scans



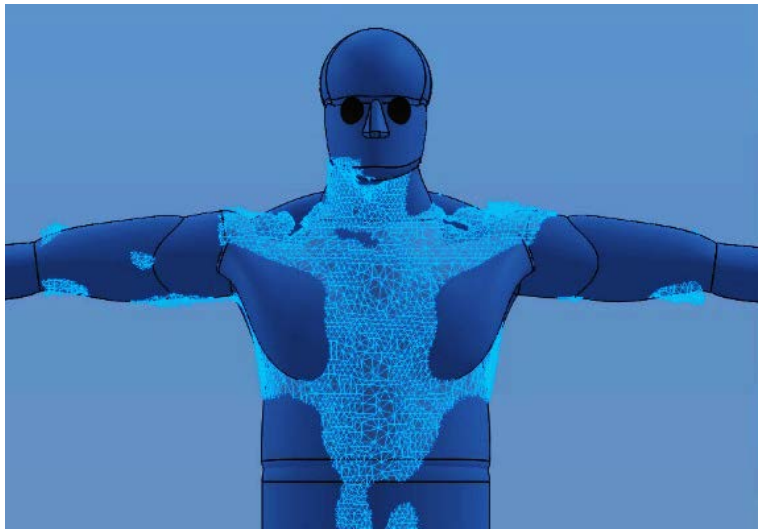


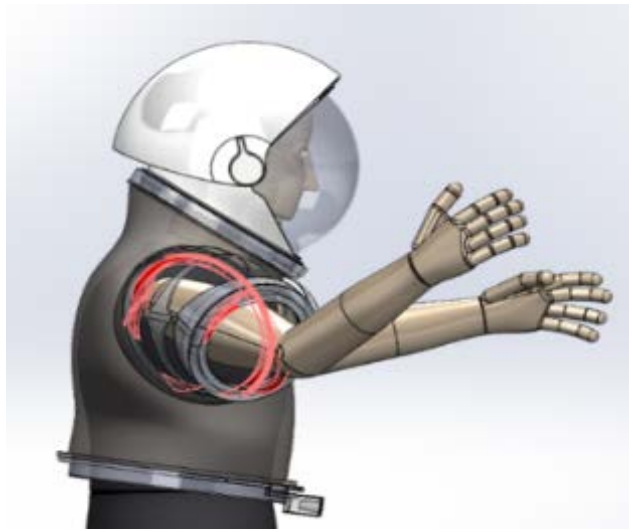
SUIT CAD MODELS

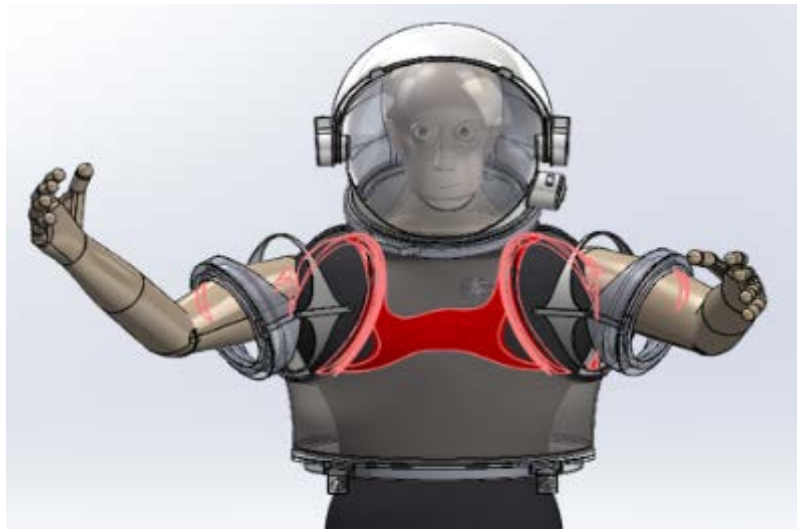




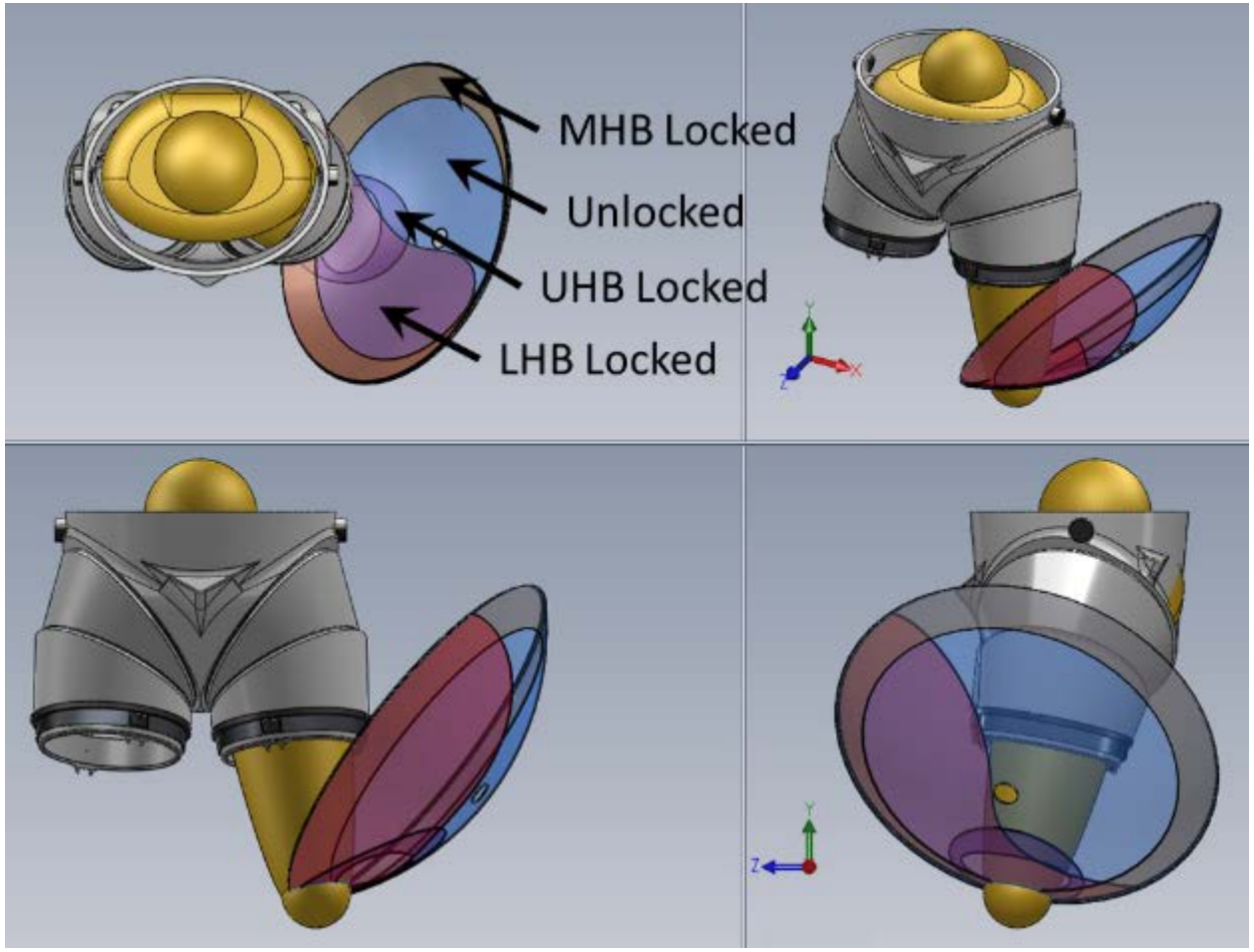
Articulated CAD Model of Human

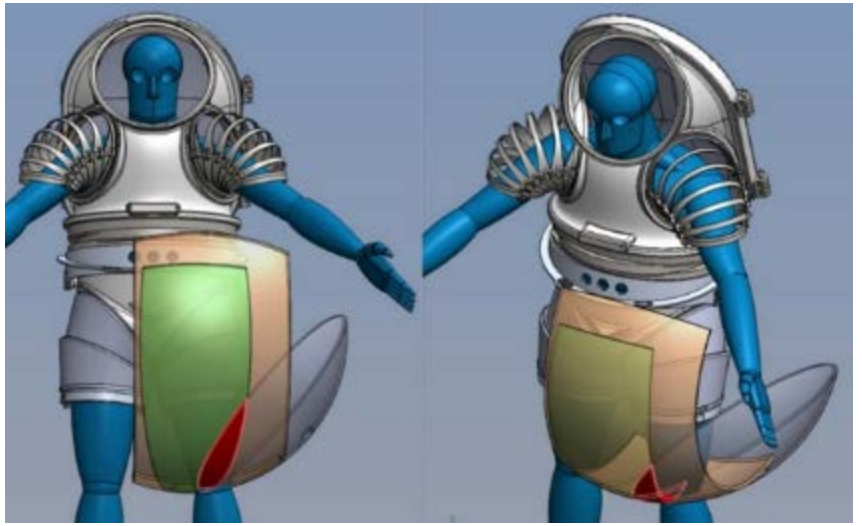


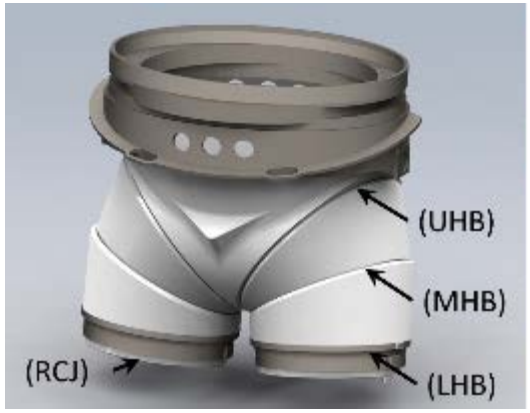




Work Envelope Estimation – Lower Body

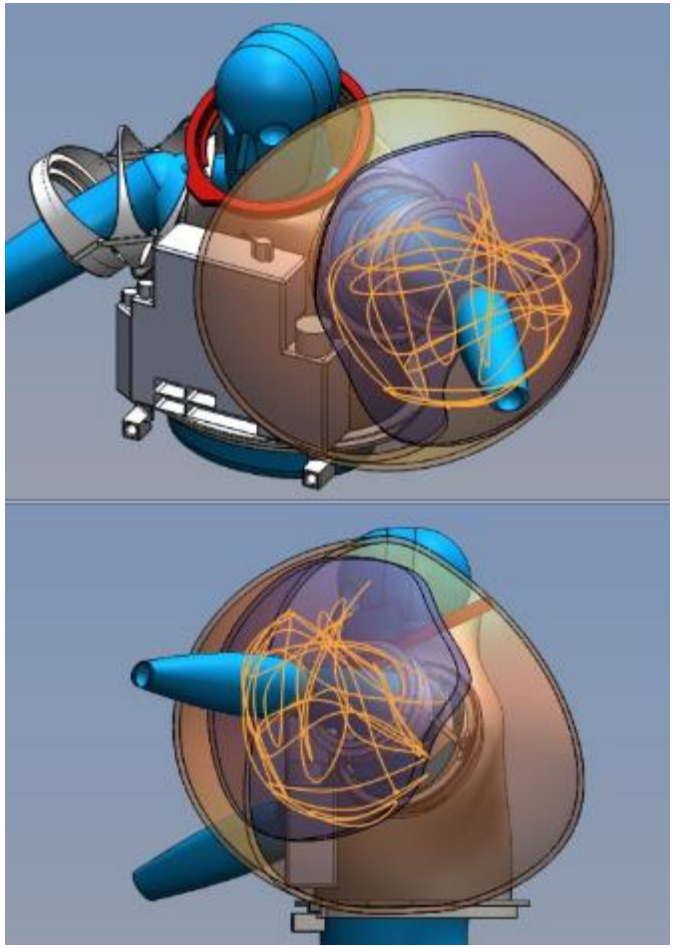


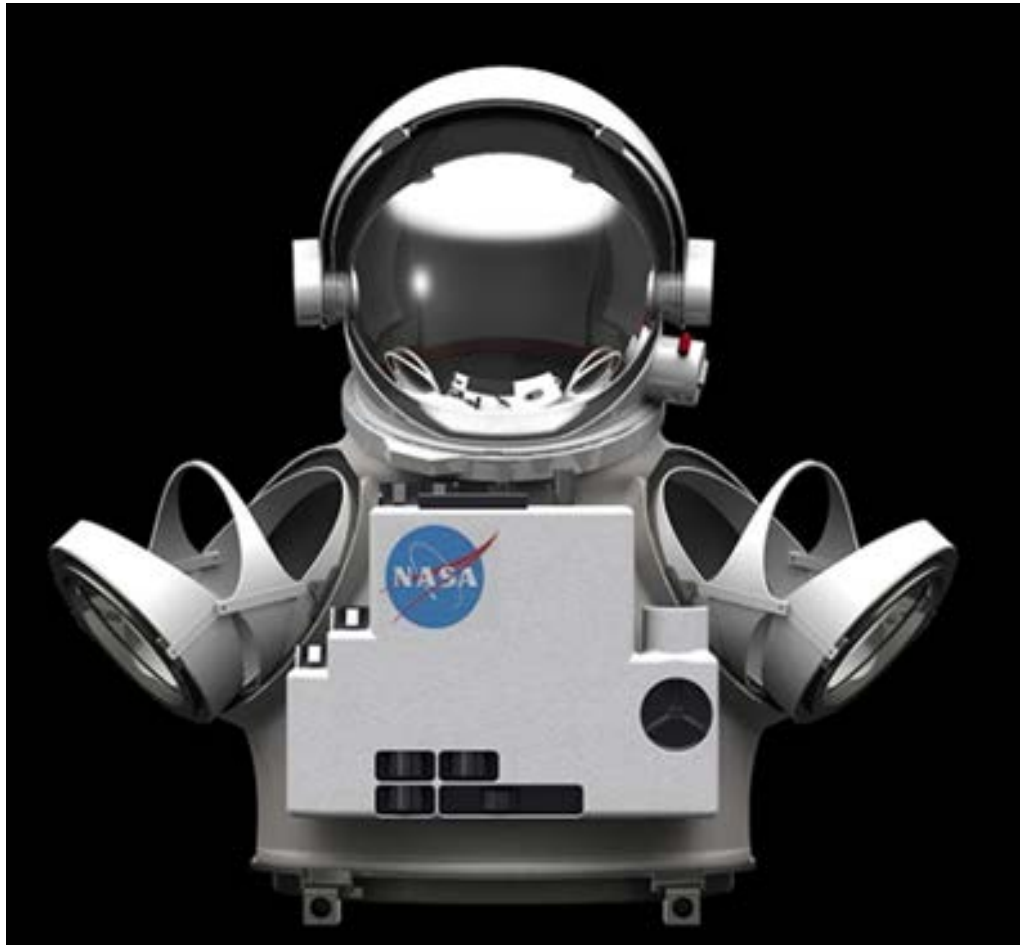




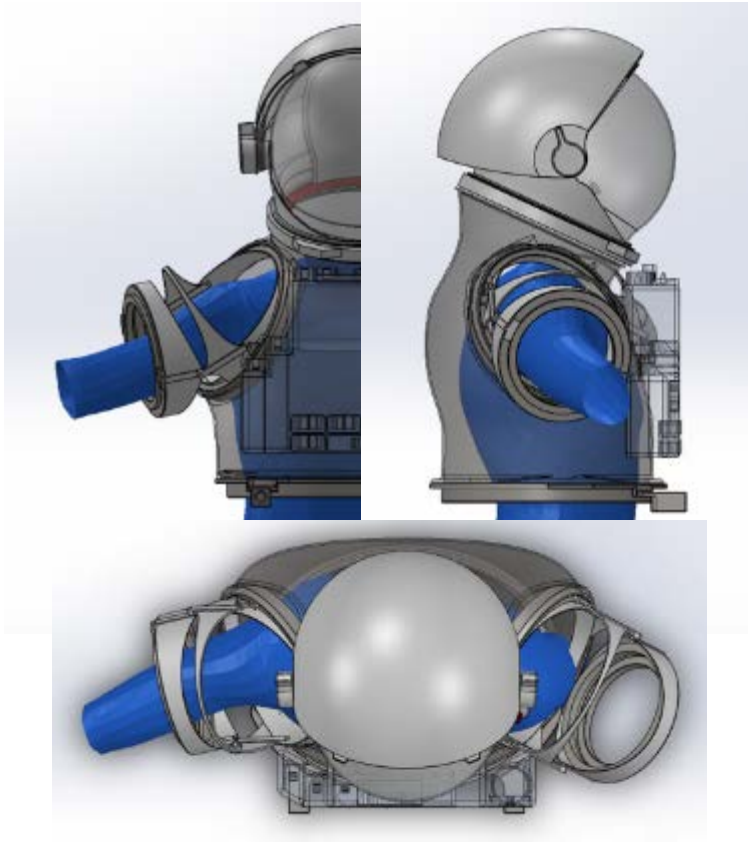
UHB: Upper Hip Bearing
MHB: Middle Hip Bearing
LHB: Lower Hip Bearing
RCJ: Rolling Convolute Joint

Work Envelope Estimation – Upper Body





Virtual Fit Assessment



Future Work/Improvements

- PROTEUS - Improvements to Virtual Fit Model
- Fleet Sizing – Future suit sizing schemes
- Implementation – Development of tools for user community